

# MY EXPERIMENTS WITH COLOUR-MUSIC

By CLAUDE BRAGDON

COLOUR-MUSIC is the organization of light into an emotional language just as—in music—sound has been organized. Such an art might prove to be more powerful and poignant than music itself because light is of all things the most marvellous. M. Luckiesh, in his *Artificial Light: Its Influence on Civilization* says: "If mobile light becomes a fine art, it will be man's most abstract achievement in art, and it may be incomparably finer and more ethereal than music." Until the advent of the electric light the necessary means for the organization of this new art were lacking; and only in comparatively recent years has it been possible to produce light of any required volume, colour, and intensity, completely and easily under control.

## Pioneer Experiments

But even before the advent of electrical illumination colour-music had been a subject of speculation and experimentation. Colour scales, analogous to the musical scale, had been worked out, and Bainbridge Bishop, a pioneer in this field, constructed a colour-organ which formed for a time one of the attractions of P. T. Barnum's famous Museum, on Broadway, New York. This instrument disappeared in the fire

which destroyed Barnum's country house at Bridgeport, Connecticut, but extant drawings and descriptions give an idea of what it was like.

It had a regular organ keyboard, pedals and stops, set in a case in the upper part of which, directly above the keyboard, was a semi-circular panel of ground glass on which the colour-music was made to appear. The instrument was placed before a sunny window, the light from which was admitted to the back of the case through little apertures glazed with variously coloured glass, each opening provided with a shutter so arranged that by pressing the keys the shutter was thrown back, letting in differently coloured light. This light, diffused and reflected on a white screen behind the ground glass panel and on the panel itself, produced a colour thereon softly shaded into the neutral tint of the glass. The instrument was arranged with a stop so that music and colour could be played separately or together. By the use of other stops the amount of light could be diminished or increased. The colours controlled by the pedals were such as could be used as a fundamental accompaniment to tint the ground with the key-note colour to indicate the key, or to change from one key to another.

At his studio in London, A. W. Rimington developed a light organ upon which he gave colour-music recitals to his friends. Both he and Bishop, as a necessary preliminary, established a correspondence between a subdivided spectrum and the musical chromatic scale of twelve semitones. Their instruments were played from a musical score upon an organ keyboard, the chief difference between them being this: Rimington, coming later in time, and therefore having electric light at his disposal, projected his colours on a screen, stereopticon-wise.

### Harnessing the Rainbow

There have been other experimentalists in this same field. It is one which I myself invaded, and this is the story, not of my triumphs, but of my failures. I cannot now remember what first interested me in the idea of colour-music. Perhaps it was the obvious analogy between the notes of the diatonic scale and the colours of the rainbow, for my first instrument, like Bishop's and like Rimington's, based on this analogy, was played from a musical score upon an organ keyboard. Though this was the obvious thing to do, later experience convinced me that it was not the right thing.

Each art-form should progress from its own beginnings and develop in its own unique and characteristic way. Any arbitrary and literal translation of a highly complex, intensely dynamic art unfolding in time as does music, into a correspondent mobile-colour expression could never be in the highest sense successful. Corres-

pondences between the arts of course exist, but each art is unique and singular, and in this singularity dwells its most thrilling appeal. These first experiments convinced me that in the harnessing of the rainbow I should preoccupy myself less with the likeness between colour and music than with their differences.

Music unfolds in *time*. Now time implies succession—one thing following another—movement, change. Colour-music unfolds in *space*. Space implies simultaneousness: in space alone perpetual immobility would reign. If there be a workable correlation between music and mobile colour, it should therefore be sought rather in the domain of harmony which involves simultaneity, than in melody, which is all succession. Moreover, the eye is less analytical than the ear, which means, in this connection, that light-changes should succeed one another less rapidly than sound-changes in order to be separately apprehended. It may be that as the eye becomes more educated it will crave more movement and complexity (such was Rimington's experience), but calmness, serenity, seem somehow of the very nature of light, just as sound seems to imply movement and passion. For music is a seeking—"love in search of a word," while light is a finding—"a divine covenant."

Accordingly, in my second experiment, without abandoning the colour scale analogous to the musical scale, I attempted no literal translation of music into colour, but rather the induction of a "musical" mood through the appeal of visible beauty into which the

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### My First Mac

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element of mobility entered. The best image I can give of this instrument (never fully completed) is of a great cathedral rose-window the colours of which undergo changes at the will of the operator analogous to a succession of musical chords, with modulations from one into another.

#### My First Machine

These experiments were undertaken in the intervals between labours of an altogether different sort. They taught me little except what not to do, they were appallingly expensive, but the whole experience was joyous and exciting, the memory of which I would not be without.

I set up my first machine in an empty store, the windows of which were darkened by black building paper. Here I gave my first Colour-Music Recital, my friend Louis Siegel officiating at the organ. Leopold Stokowski happened to be in Rochester that afternoon, and I tried to get him to come, but he had to attend an orchestra rehearsal. After I had explained to him what I was trying to do he made the remark that in light there was probably inherent a greater art than music for the reason that light was a more wonderful medium than sound. I was glad afterward that he had not come to my recital, so inferior it was to what I had imagined it might be. I salvaged what I could of that first machine, and sent the rest to the city dump.

#### Memorable Nights

For my second experiment, undertaken a long time afterwards,

I hired what had once been a hay-loft over a livery stable, later converted into a garage. I was busy all day at the office; domestic and social life absorbed my evenings, so the only time I had to devote to colour-music was late at night. At the end of an evening spent at a party or at the theatre, or coming down town for the purpose, late at night, I would seek out that alley door and steal up that dark stairway like a lover going secretly to meet his mistress, so eager was I to keep this tryst with light. Seated all alone at the keyboard in the cavernous spaces of that enormous room, with the touch of a finger I would conjure out of the darkness forms and colours of such intoxicating beauty that I lost all sense of where I was—even of who I was. I realized how Michelangelo must have felt all alone high aloft on his scaffolding while he was painting the Sistine ceiling, for I was visited with strange exaltations which make these nights memorable.

This second venture came to an abrupt end through lack of money to continue: the initial cost of the machine was excessive, I was paying an electrician nine dollars a day, the rental of the loft was a considerable item, and I found that I was spending more than I could possibly afford. I therefore terminated my lease, discharged my workman, and sent this machine also to the city dump—and without undue regrets, for although an improvement on the first one, its limitations made it useless for the realization of the thing I had in mind.

### Brice's Light-Theatre

Van Deering Perrine the painter, and Thomas Wilfred the lute player were among those who shared my interest in colour-music. We conceived the notion of forming a nation-wide—perhaps a world-wide—organization of people interested, in any active way, in light as a medium of emotional expression, to be called the Prometheans. We succeeded in interesting my friend Kirkpatrick Brice so deeply in our project that he agreed to build an experimental light-theatre on his estate at Huntington, Long Island, and finance it for a limited period of time. I drew the plans for this building, the first of its kind, so far as I am aware. It consisted of a large work-room with a shell-shaped cyclorama at the far end, made of white plaster. Opposite this, and separated from it by the length of the room, was a projection-booth and switchboard. Above was a bank of seats for a few spectators, so enclosed that they could see nothing but the white field of the cyclorama upon which the colour-music was made to appear at the will of the operator.

As soon as the building was completed Wilfred moved to the farm at Mr. Brice's invitation, and took up his residence over the garage so that he might work all day and every day in the well-equipped laboratory. Although both Perrine and I had devised and exhibited mobile colour machines, Wilfred, a skilled mechanic and electrician, with clear-cut ideas of what he wanted to do and how to go about it, soon assumed the dominant position in our triumvirate, with the result that Perrine

and I were more or less relegated to the role of spectators rather than participators. Our Society died in the womb, so to speak: the whole thing had become a one-man affair. Wilfred constructed his Clavilux single-handed, and in due course gave a demonstration of it at the Grand Street Playhouse, in New York. From that time forth Wilfred has devoted himself to the improvement of his instrument and to the giving of mobile-colour recitals—a field in which he has no competitors.

The light-laboratory passed into other hands after Mr. Brice's death, and is now doubtless converted to other uses. For the third time I experienced arrestment in my pursuit of that Immortal Beloved, colour-music, my secret ardour only increased by frustration. Although the necessity of making a living forced me to follow paths more remunerative, subjectively I must have been busy with this problem, for whenever I took it up again in some interval of enforced leisure, my ideas seemed to have clarified and crystallized into some more definite and more beautiful pattern.

### Technique of Colour

Convinced that the musical parallel was not the best approach to a new art of mobile colour—colour music—I decided that the first thing to find out would be the instinctive emotional reactions to colour and light common to everyone. Though this is a comparatively new field of research, certain facts have been established. In general, pure colours are preferred to tints and shades, and of pure

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colours, red and blue are the favourites. The colours of the spectrum divide themselves naturally into three groups, corresponding to the three primaries; blue, green, and red. The first comprises blue, indigo, and violet, the "cold" colours, occupying the electric end of the spectrum, and highest in vibratory rate. The second comprises green and yellow; and the third, orange and red—"warm" colours, occupying the thermal end of the spectrum, and lowest in vibratory rate. Each group, and each colour of each group has a different effect upon the human consciousness, that of the first group being, in general, subduing; of the second, tranquillizing; and of the third, stimulating.

This was confirmed by my own experience in the theatre, where I learned that the colour and quality of the light had a marked and definite effect upon an audience. Cold light induces a mood bordering on the mystic or the melancholy. A comedy scene cannot be played in a blue light. "Amber" produces a contrary effect; it is a cheerful light, and therefore good for comedy. Red light is stimulating, exciting, even irritating—good therefore for scenes of strife and combat. It is astonishing to what extent the lighting of a scene may enhance or impair its effectiveness without the spectator being in the least aware.

Attempts have been made to determine the symbolical significance and characteristic "mood" of each one of the spectral hues at different degrees of intensity—for it is clear that the dark values

of a colour would produce an effect different from that produced by the light values. Beatrice Irwin's conclusions with regard to the effect of different colours upon consciousness seem to me well based, and in my researches I came upon a chart by Charles E. Vautrain in which his findings in this field are tabulated. From whatever sources he drew his data, his conclusions seem justified.

#### Correspondences with Human Auras

I found another approach to what I was after in the analogy between the three groups of colours in the spectrum and the triune nature of man, familiar to Theosophists, which Delsarte made the basis of his *Art of Expression*. Delsarte held that the legs and loins represent the physical nature—the *will*; the torso the emotional nature; and the head the intellectual or spiritual. He taught that each part was itself a triplicity, correspondingly related. In the torso, for example, the genital and digestive regions correspond to the physical; the solar plexus region to the emotional, and the breast to the mental and spiritual nature, and so on.

Were we to interpret the spectrum in similar fashion, attributing to each of its three main divisions a like meaning, "influence" or function, it is clear that the red end, being lowest in vibratory rate, would correspond to the physical nature (proverbially the most sluggish); the middle, or green section to the emotional; and the blue end, containing the colours of highest vibratory rate, would have relation to the mind

and spirit. Reason, observation, and experience would seem to confirm such a classification, and Delsarte's theory is capable of a more extended application. To him "below" stood for the nadir of ignorance and impotence; "above," the zenith of wisdom and power. Sombre and degraded hues would therefore have relation to the first, and clear and luminous ones to the second. This is curiously confirmed by Dora Van Gelder's clairvoyant examination of the human aura: there the muddy, dark, unclear colours are at the bottom, they correspond to man's unregenerate nature, while the bright, clear, luminous colours are at the top.

With only these simple concepts and these scant data for a guide, it seemed to me possible to approximate a colour-expression of musical "moods" and also to test out the musical parallel. This seemed the right way to go to work, but having now no time, place, or equipment, I had no other resource than to continue my theorizing as follows:

#### Music and Mathematics

In colour-music *form* should play an important part; for here is another golden ball to juggle with, which no art purely in *time* affords. It is true that music has form, pattern, and an architecture of its own, but these things are perceived with the mind's eye, or subjectively; they are not clear, concrete, palpable, as are the forms of space. Musical sounds weave invisible patterns in the air, and one of the more remote achievements of our uncreated art

may be to make these patterns visible. Meantime, with the entire treasury of forms to draw from, only such as are *abstract* seem suitable for this purpose, because the forms of nature are so full of associations with that world of concreteness and materiality from the tyranny of which this art, like music, should enable us to escape. Pure colour, which is itself abstract; music, which is abstract sound; and forms which are abstract, should constitute, in my opinion, the elements of this new art.

The colours (until the eye becomes more educated) ought to succeed one another not too rapidly; meet, mingle, and undergo transformations like those retinal images seen with the eyes closed, or like an accelerated sunset. Superimposed upon this changing colour background, like an air upon its accompaniment, abstract forms in pure white light should appear, develop, wax and wane, in synchronization with the music as intricate and precise as in an animated cartoon. It was thus that I saw colour-music "in my mind's eye."

The colour element would present no difficulties; it could be achieved in a number of different ways; by projectors, prisms, polarized light. The music need be none of my affair, that I could delegate to others; but what of the form element? What should be its nature, and from what source should it be drawn? Music is in the last analysis mathematics made audible. The ideal solution would be to make mathematics visible as well. I had already discovered a way in my search for that new

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ornamental mode named by me "Projective Ornament" because derived from the projections of symmetrical solids and hyper-solids (four-dimensional forms). Some of the configurations evolved by this method were of extraordinary intrinsic beauty—like flowers and frost. The "what" was therefore provided for; now as to the "how":

#### Colour Projection

My own experiments, Perrine's and Wilfred's convinced me that no colour-music *machine*, such as the Clavilux, no matter how intricate or ingenious, could be completely satisfactory: in time it would betray its limitations and a loss of interest would result—as in the case of a card trick after one found out how it was done. Colour-music must be infinite in every one of its three dimensions of colour, form and movement. Nothing less than this would satisfy for long.

I could think of only one way to meet this condition: a separate form-and-sound film for every composition—the animated cartoon technique, in other words a technique which, however trivial the subject treated, had been brought to the highest point of perfection. It so happened that I knew one of the pioneers in this particular field, and by visiting his studio I found out at first hand how animated pictures were drawn, photographed, and mathematically synchronized with the music on the basis of twenty-four "shots" for every second of time.

Clearly, to make even one reel such as I had in mind would be impossible of accomplishment

single-handed, for that sort of thing involved the co-ordination of several highly specialized varieties of talent directed by one master-mind and an outlay of money to which my former expenditures were as nothing. The utmost I could hope to achieve unaided would be to provide a series of drawings corresponding to those made by the "animators" representing the beginning and end of a movement, to which the "in-betweeners" impart the illusion of motion by means of a great number of supplementary drawings. This much I determined to do.

Accordingly, I bought a second-hand Victrola and a record of Beethoven's "Moonlight" sonata (*Sonata quasi una Fantasia*), together with the piano score, my earlier efforts having been concerned with that particular piece. I began by making a note-by-note colour-translation of the first two movements in conformity with Wilson's ophthalmic colour scale, which seemed to me the best. This would give me the clue to the colours and colour-sequences to be employed. Next I made a similar translation of the music in terms of form by means of a series of drawings embodying my idea of what this translation ought to be—at least one drawing to every measure, one hundred and seventy in all. These corresponded to so many "stills" in a moving picture, which would have to be supplemented by as many others—a vast number—as the necessity for the illusion of movement might require. I went through the same process with Waldteufel's *Les Patineurs* (Skaters' Waltz), Delibes' *Pizzicati*

and *Valse Lente* from the Sylvia Ballet suite, and Sibelius' *Valse Triste*. This involved the making of hundreds of drawings, some so elaborate that they took me several days to do.

#### Attitude of Investors

This was as far as I could go single-handed. The next step would be to have sound-film made under my direction and the colour sequences established by actual experiment. I could direct these operations, given a suitable laboratory and the right people and equipment with which to work. As these could be found ready-made only in the moving picture industry, it was at that door which I must needs knock. Armed with excellent introductions I interviewed high officials in this industry, always with the same ultimate result: I was received politely, listened to with attention, asked always the same questions to which I made always the same replies. Sometimes I attended "conferences," but invariably I was dismissed with vague excuses, or still more vague assurances that the matter would be taken up at some future time; or I was referred to some other member of the same organization or of another, in the end only to complete a circuit which finished where it began. Of all the people I interviewed only three showed genuine interest and understanding, but not one of these was

so situated as to do anything to help me except to pass me on to someone else whom he thought might.

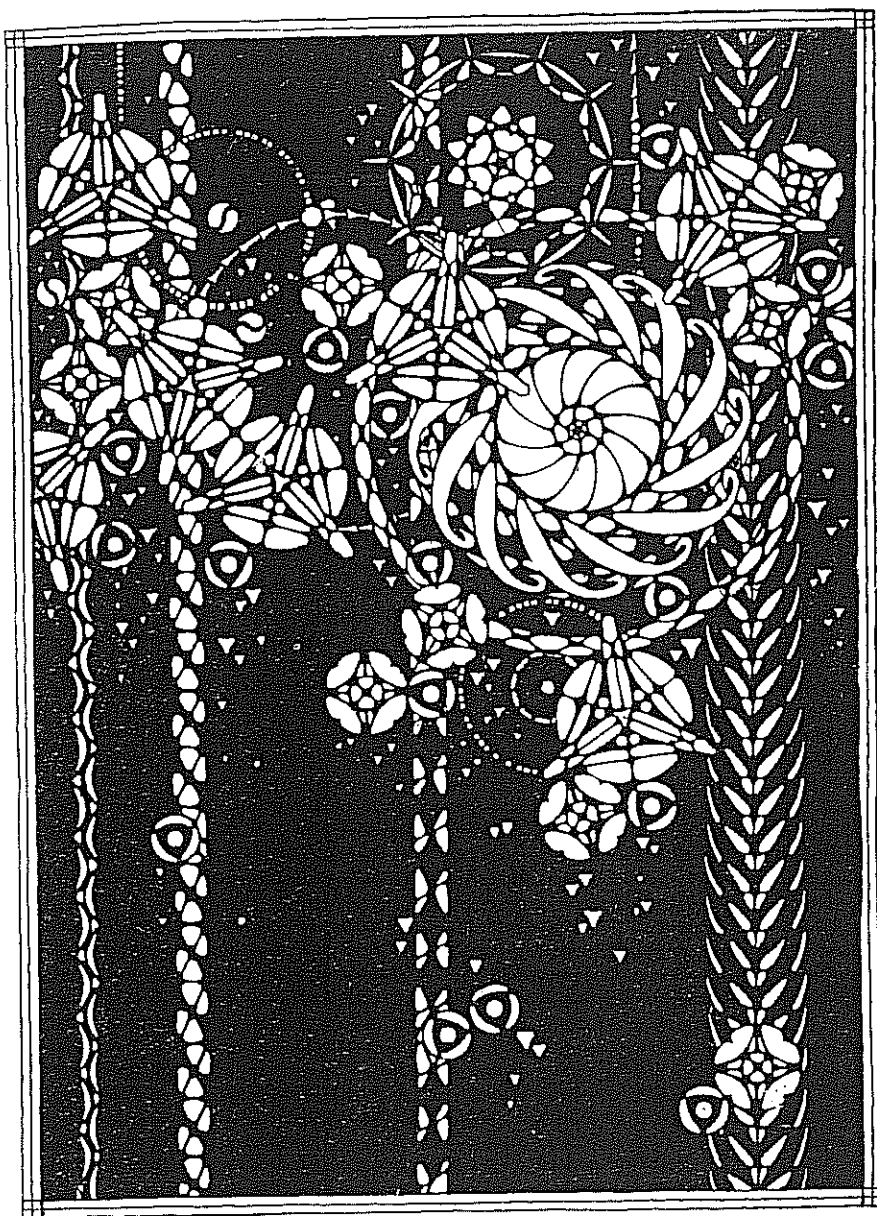
The reason they all shied away from my colour-music as I presented it to them was because it was too untried, too unlike anything else to enable them to judge of its attractive value, and none of them wanted to shoulder the responsibility of making a wrong guess. One high official whom I interviewed told the mutual friend who had provided the letter of introduction that "the trouble with Mr. Bragdon is that he is about ten years ahead of the times." The attitude and argument of all of them amounted to this: they could not invest money in experimenting with something the issue of which was avowedly problematical, and even if successful the sale of which on a large scale could not be insured in advance. From their own point of view, which was strictly commercial, they were probably right, and there the matter rests.

But though I proved myself a poor salesman, I gained by these means a glimpse into the inside workings of that fabulous world fed and sustained by ministering to the "escape complex" of millions of human beings. I found in that world no vision, no imagination, no idealism divorced from the desire for profit, but only a beaver-like competence to do some poor thing well.

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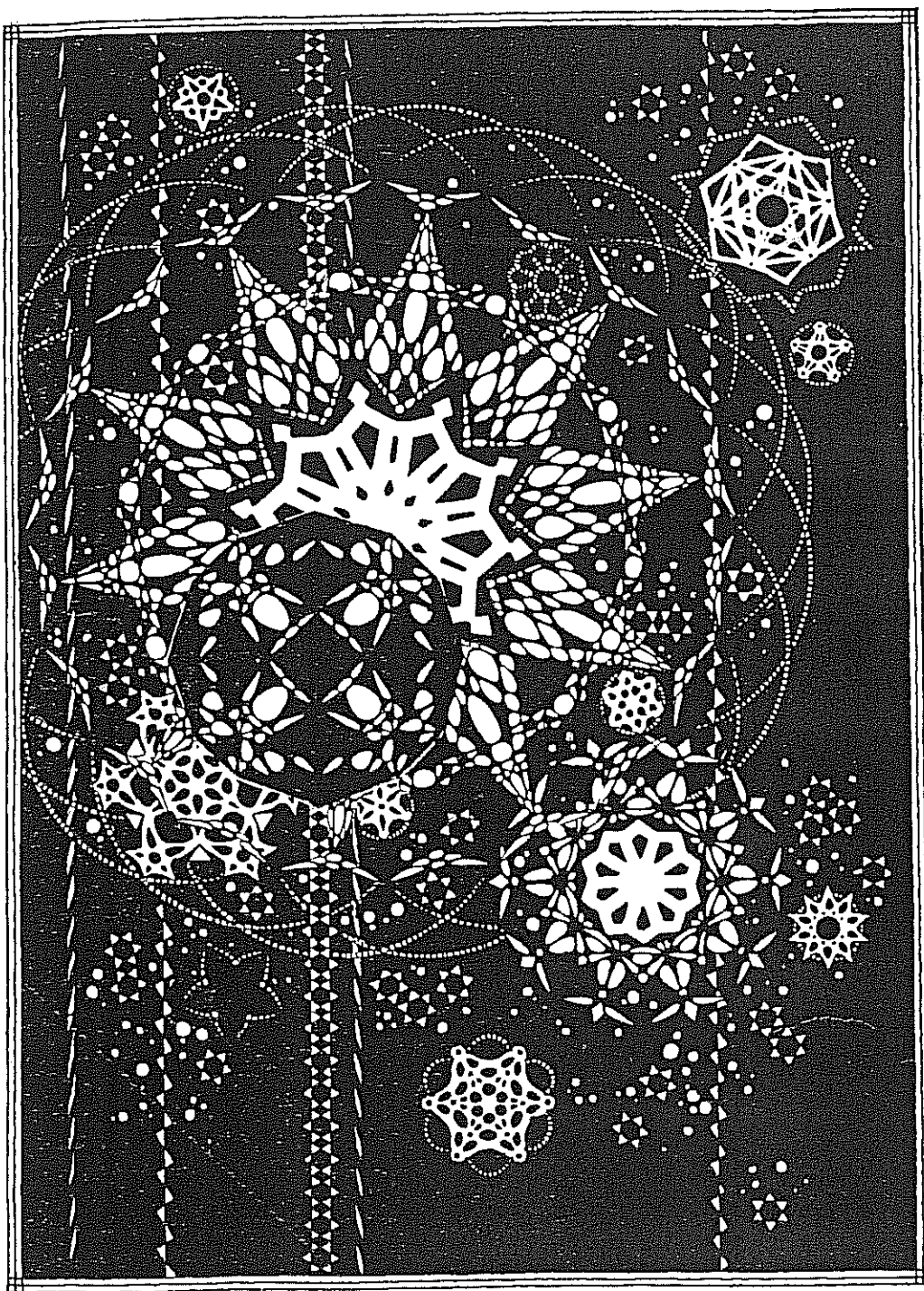
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## ON T

### *Theosophy as Beauty*

IN a recent issue of THE SOPHIST I suggest have already witnessed interpretations of Theosophy that we are now on the verge of a fifth, an interpretation which I anticipate Rukmini Devi might do. This fifth in itself has seemed to me, through the Arts, so to have already had Theosophy interpreted in terms of wisdom, we shall now have an interpretation of our Theosophy in terms of beauty.

I am happy to see public work for this nation was begun at Adyar 15th last, when Shrinani Devi gave a public Recital of Indian Dance a very large and attentive audience. The setting Recital was indeed beautiful it was in the open air, comparative cool of the evening, and the audience the spreading branches

# THE THEOSOPHIST

(With which is incorporated LUCIFER)

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